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PATENT
Attorney Docket No.: WCM1-0021

AF 1/7/25/10
#8

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent Application of: Thomas N. Chalin
Serial No.: 09/814,535
Filed: March 22, 2001
Entitled: SUSPENSION SYSTEM
INCLUDING ARM HAVING
ZERO CLEARANCE AXLE
CONNECTION
Group Art Unit: 1725
Examiner: J. Johnson

APPEAL BRIEF

Commissioner for Patents
Washington, D.C. 20231

Sir:

The Appellant hereby timely submits this Appeal Brief in triplicate under the provisions of 37 CFR §1.192(a) and respectfully requests consideration thereof before the Board of Patent Appeals and Interferences. Appellant's Notice of Appeal was filed on July 30, 2002, appealing to the Board from the decision of the Examiner, mailed July 2, 2002, finally rejecting Claims 1-15 of the above-identified patent application.

A check in the amount of \$160.00 is enclosed herewith in payment of the fee specified in 37 CFR §1.17(c). The Commissioner is hereby

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authorized to charge any deficiency or credit any overpayment to deposit account no. 11-1543. A duplicate of this sheet is enclosed.

REAL PARTY IN INTEREST

The real party in interest is the assignee of the present application, Watson & Chalin Manufacturing, Inc. of McKinney, Texas.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellant, the appellant's legal representatives or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF CLAIMS

All of the originally filed Claims 1-15 remain pending, stand under final rejection, and these rejections of Claims 1-15 are appealed.

STATUS OF AMENDMENTS

No amendments have been made to the claims in this application. The claims as set forth in Appendix A are the originally filed claims.

SUMMARY OF THE INVENTION

The present invention advances the art of manufacturing vehicle suspension systems by providing, in the embodiment described in the specification, a method of manufacturing which attaches an axle connector to an axle without press-fitting the axle connector onto the axle, and without clamping the axle connector to the axle. A zero clearance between the axle connector and the axle is obtained, which enhances the quality and strength of welds between the axle connector and the axle.

Manufacturing steps are eliminated, thereby decreasing time and costs of producing the suspension system. Elements, such as clamps, bolts, etc., are eliminated from the suspension system, thereby decreasing weight, inventory and costs. Furthermore, close tolerance machining, such as is necessary for press-fitting parts together, is also eliminated, further decreasing manufacturing costs and time.

In the described embodiment, the axle connector extends more than halfway about the axle, without completely encircling the axle. The axle connector is initially attached to the axle by elastically deforming the axle connector, so that it fits over the outer diameter of the axle, and then permitting the axle connector to spring back and grip onto the outer diameter of the axle. This provides zero clearance between the axle connector and the axle. The axle connector is then welded to the axle.

ISSUES

Whether Claims 1-15 are properly rejected under 35 USC §103(a) as being unpatentably obvious over U.S. Patent No. 6,039,336 to Frey in view of U.S. Patent No. 6,241,266 to Smith et al.

GROUPING OF CLAIMS

Although each of Claims 1-15 stands rejected as being obvious over Frey in view of Smith et al., the claims of this group do not stand or fall together. Rather, the appellant submits that each of the rejected claims stands on its own recitation, and each claim is considered separately patentable for reasons set forth in more detail below.

ARGUMENT

I. Rejections under 35 USC §103

The examiner has failed to make out a *prima facie* case of obviousness of Claims 1-15. No combination of the teachings of the references cited by the examiner in rejecting these claims would result in the steps and limitations recited in the rejected claims. Since the combined references do not teach or suggest all the claim elements and limitations, a *prima facie* case of obviousness has not been established by the examiner.

The examiner has combined the Frey and Smith et al. references in an attempt to assert that the claims are unpatentably obvious, but since these combinations of references do not meet all of the recited steps and limitations of the claims, a *prima facie* case of obviousness has not been established by the examiner. Therefore, the Board is respectfully requested to direct the examiner to withdraw the rejections of Claims 1-15.

Claim 1 recites a method wherein an axle connector is welded to an axle without first pressing the axle connector onto the axle from an end of the axle, and without using a clamp to hold the axle connector in contact with the axle. The axle connector is also welded to a pivot arm of the suspension system.

The examiner asserts in the final Office Action that Smith teaches welding an axle connector to an axle without first pressing the axle connector onto the axle from an end of the axle and without using a clamp to hold the axle connector in contact with the axle. The examiner further asserts that these features may be found in the embodiment shown in FIGS. 15 & 16 of Smith.

However, a careful reading of the Smith specification reveals that, in fact, the wrapper band 232 shown in FIGS. 14-16 is press-fit onto the axle 12 (see column 14, lines 58-61). The wrapper band 232 completely encircles the axle 12, and so it must be press-fit onto the axle from an end

of the axle. Clearly, Smith does not teach the limitations recited in Claim 1 as asserted by the examiner.

Frey also does not teach the limitations recited in Claim 1. The examiner asserts that Frey teaches welding an axle to a pivot arm, which extends greater than halfway about the axle, but does not specifically teach the use of an axle connector. This is correct. In fact, Frey teaches directly away from the use of an axle connector between an axle and a pivot arm.

Therefore, it may be seen that the steps and limitations recited in Claim 1 are simply not found in Frey or Smith. No combination of the teachings of these references will result in the invention of Claim 1. Thus, a *prima facie* case of obviousness of Claim 1 has not been made out by the examiner.

However, even if all of the steps and limitations of Claim 1 could be found in the combined teachings of Frey and Smith, this combination would be improper. This is due to the fact that both Frey and Smith teach directly away from the claimed invention.

Frey specifically states that a suspension arm (pivot arm) should be welded directly to an axle without the use of a reinforcing sleeve between the arm and the axle (see column 1, lines 19-34). Frey teaches that the type of reinforcing sleeve used in Smith should not be used. Thus, not only

does Frey teach away from the claimed invention, Frey also teaches away from combining his assembly method with that of Smith.

Smith teaches away from the invention in that it teaches that axle connectors should be press-fit onto axles (see column 14, lines 58, 59). In other embodiments, Smith teaches that axle connectors should be clamped onto axles. Thus, Smith teaches away from the method recited in Claim 1.

Claim 2 recites the method of Claim 1 in combination with the limitation that the axle connector is held in contact with the axle during the welding step by elastically deforming the axle connector. A *prima facie* case of obviousness of Claim 2 has not been made out by the examiner, for the further reason that neither of the cited references teaches this limitation.

The examiner asserts that Smith discloses this limitation in that the wrapper band 232 is described as being heated before being press-fit onto the axle 12 (see column 14, line 62 - column 15, line 10). The examiner equates this thermal deformation with the elastic deformation recited in Claim 2.

However, any person skilled in the mechanical arts will appreciate that thermal deformation is quite different from elastic deformation. The examiner has failed to find this limitation of Claim 2 in Smith. Thus, the

examiner has failed to make out a *prima facie* case of obviousness of Claim 2.

In addition, the Frey and Smith references cannot be properly combined in rejecting Claim 2 for the reasons set forth above in relation to Claim 1. Both Smith and Frey teach directly away from the claimed invention, and at least Frey teaches away from its combination with Smith.

Claim 3 recites the method of Claim 2, and adds limitations further defining the step of elastically deforming the axle connector. One such limitation is that an inner dimension of the axle connector is enlarged in the elastically deforming step.

The examiner again asserts that these limitations are found in the embodiment disclosed in Smith. However, as discussed above, Smith describes thermal deformation of the wrapper band 232, not elastic deformation. Smith does not describe a method in which a step of elastic deformation is performed by enlarging an inner dimension of an axle connector. Therefore, a *prima facie* case of obviousness of Claim 3 has not been made out by the examiner.

In addition, the Frey and Smith references cannot be properly combined in rejecting Claim 3 for the reasons set forth above in relation to

Claim 1. Both Smith and Frey teach directly away from the claimed invention, and at least Frey teaches away from its combination with Smith.

Claim 4 recites the method of Claim 1, and adds limitations to further define the step of welding the axle connector to the axle. No clearance exists between the axle connector and the axle in the welding step.

The examiner again asserts that Smith discloses this limitation. However, Smith does not describe how zero clearance can be obtained between an axle connector and an axle in a welding step wherein no press-fitting and no clamping is used to attach the axle connector to the axle. Instead, Smith teaches precisely those methods (press-fitting and clamping) for attaching the wrapper band 232 to the axle 12. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 4.

In addition, the Frey and Smith references cannot be properly combined in rejecting Claim 4 for the reasons set forth above in relation to Claim 1. Both Smith and Frey teach directly away from the claimed invention, and at least Frey teaches away from its combination with Smith.

Claim 5 recites the method of Claim 1 and adds limitations which further define the step of welding the axle connector to the axle. In the welding step, the axle connector is a single structure which extends greater than halfway about the axle.

The examiner asserts that this limitation is found in Frey in the embodiment shown in FIG. 1 (elements 3 and 7). However, element 3 is a weld which attaches an arm 2 to an axle 1, and element 7 is an increased wall thickness portion of the axle 1. Frey specifically teaches away from welding another member between the arm and the axle.

Frey does not teach the step of welding an axle connector to an axle, wherein the axle connector is a single structure which extends greater than halfway about the axle. Instead, Frey teaches that an axle connector should not be welded to an axle. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 5.

In addition, the Frey and Smith references cannot be properly combined in rejecting Claim 5 for the reasons set forth above in relation to Claim 1. Both Smith and Frey teach directly away from the claimed invention, and at least Frey teaches away from its combination with Smith.

Claim 6 recites the method of Claim 1, and adds limitations which further define the step of welding the axle connector to the axle. In the welding step, the axle has a cylindrical outer surface, the axle connector is a single structure, and the axle connector extends greater than 180° about the axle outer surface.

The examiner has not specifically pointed out where these limitations are described in Frey or Smith. Assuming that the examiner considers the Frey reference to teach these limitations, as with Claim 5 discussed above, the Appellant agrees that Frey teaches an axle having a cylindrical outer surface. However, Frey clearly does not teach the use of an axle connector welded to an axle, and Frey certainly does not teach the use of an axle connector as a single structure extending greater than 180° about the axle outer surface. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 6.

In addition, the Frey and Smith references cannot be properly combined in rejecting Claim 6 for the reasons set forth above in relation to Claim 1. Both Smith and Frey teach directly away from the claimed invention, and at least Frey teaches away from its combination with Smith.

Claim 7 recites the method of Claim 1 and adds an order of the steps which further defines the method. The step of welding the axle connector

to the pivot arm is performed after the step of welding the axle connector to the axle.

The examiner asserts that this limitation is found in the embodiment of Smith shown in FIG. 16. However, Smith does not describe the step of welding the wrapper band 232 to the arm 18 at all. Instead, the wrapper band 232 is bolted to the arm 18 (see FIG. 1). Smith simply cannot describe the order of welding steps recited in Claim 7, because Smith does not describe one of the welding steps at all. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 7.

In addition, the Frey and Smith references cannot be properly combined in rejecting Claim 7 for the reasons set forth above in relation to Claim 1. Both Smith and Frey teach directly away from the claimed invention, and at least Frey teaches away from its combination with Smith.

Claim 8 is an independent claim which recites a method of manufacturing a vehicle suspension system in which an axle connector is attached to an axle by elastically deforming the axle connector, which extends less than completely about the axle when the axle connector is attached to the axle.

The examiner asserts that these limitations are found in a combination of the teachings of Frey with the teachings of Smith. However, as discussed above, Frey does not teach the use of an axle connector attached to an axle, and Smith does not teach elastic deformation of an axle connector to attach an axle connector to an axle. Frey also does not teach an axle connector extending less than completely about the axle when the axle connector is attached to the axle. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 8.

In addition, Frey cannot properly be combined with Smith in an obviousness rejection of Claim 8. As discussed above, both Frey and Smith teach directly away from the invention recited in Claim 8. At least Frey teaches away from its combination with Smith. Therefore, a person skilled in the art certainly would not be motivated to modify the teachings of Frey with the teachings of Smith as proposed by the examiner.

Claim 9 recites the method of Claim 8 and adds the steps of welding the axle connector to the axle, and welding the axle connector to a pivot arm.

Frey contains no teachings of the use of an axle connector, and actually teaches away from such use of an axle connector. Smith contains no teachings of the step of welding the axle connector to a pivot arm.

Smith does not teach that an axle connector extending less than completely about the axle should be welded to the axle. Smith also does not teach that an axle connector elastically deformed in attaching it to the axle should also be welded to the axle.

Therefore, it may be seen that no combination of the teachings of Frey and Smith would result in the invention recited in Claim 9. Accordingly, the examiner has failed to make out a *prima facie* case of obviousness of Claim 9.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 9. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

Claim 10 recites the method of Claim 9 and adds the limitation that the axle connector is welded to the axle before the axle connector is welded to the pivot arm.

Neither Frey nor Smith discloses this order of steps in the manufacture of a suspension system. As mentioned above, Frey does not describe the welding of an axle connector to an axle and pivot arm at all. Instead, Frey specifically teaches away from the use of an axle connector

welded between an axle and a pivot arm. Smith does not describe welding an axle connector to a pivot arm. Thus, Smith simply does not describe the order of steps recited in Claim 10, since Smith is missing one of the steps.

No combination of the Frey and Smith references meets the steps and limitations recited in Claim 10. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 10.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 10. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

Claim 11 recites the method of Claim 8 and adds limitations which further define the step of attaching the axle connector to the axle. In the attaching step, the axle connector extends greater than halfway about the axle.

Frey does not teach the use of an axle connector attached to an axle, and does not teach the axle connector extending greater than halfway about the axle. In fact, Frey teaches away from the use of an axle connector attached to an axle. Smith does teach the use of an axle

connector which extends greater than halfway about an axle, but does not teach the use of such an axle connector in the method of Claim 8 as recited in Claim 11. For example, Smith does not teach the use of such an axle connector which is elastically deformed in attaching it to the axle. Thus, no combination of the teachings of Frey and Smith will result in the invention recited in Claim 11.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 11. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

Claim 12 recites the method of Claim 8, and adds limitations which further define the step of attaching the axle connector to the axle. In the attaching step, the axle has a cylindrical outer surface, and the axle connector extends greater than 180° about the axle outer surface.

Both Frey and Smith teach the use of an axle having a cylindrical outer surface. However, Frey teaches directly away from the use of an axle connector, and Frey certainly does not teach the use of an axle connector which extends greater than 180° about the axle outer surface. Smith does not teach the attaching of an axle connector which extends greater than 180° about the axle outer surface to the axle by elastically

deforming the axle connector. No combination of the teachings of Frey and Smith will result in the invention claimed in Claim 12. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 12.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 12. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

Claim 13 recites the method of Claim 8, and adds limitations which further define the attaching step. No separate clamp is used to hold the axle connector in contact with the axle in the attaching step.

Since Frey does not teach the use of an axle connector, and actually teaches away from the use of an axle connector, Frey simply does not contain any teaching of an axle connector held in contact with an axle without the use of a separate clamp. Smith describes several embodiments in which a clamp is used to hold the axle connector in contact with the axle during welding, and at least one embodiment in which the axle connector is itself a clamp. However, Smith does not teach such an axle connector being elastically deformed in the attaching step, or the axle connector extending less than completely about the axle in the attaching step. Thus,

no combination of the Frey and Smith references can meet the steps and limitations recited in Claim 13. The examiner has failed to make out a *prima facie* case of obviousness of Claim 13.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 13. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

Claim 14 recites the method of Claim 8, and adds limitations which further define the step of attaching the axle connector to the axle. The attaching step is performed without pressing the axle connector axially onto an end of the axle.

Frey does not contain any teaching of the use of an axle connector. Instead, Frey teaches directly away from using such an axle connector attached to an axle. Smith specifically describes the press-fitting of the wrapper band 232 onto the axle 12 (see column 15, lines 4-10), and provides an illustration of this process in FIG. 16. Thus, Smith does not teach the use of an axle connector which is elastically deformed in attaching it to an axle, without pressing the axle connector axially onto an end of the axle. Rather, Smith teaches just the opposite. Therefore, it may be seen that the combination of these references proposed by the examiner

does not meet the steps and limitations recited in Claim 14, and the examiner has failed to make out a *prima facie* case of obviousness of Claim 14.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 14. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

Claim 15 recites the method of Claim 8, and adds limitations which further define the step of attaching the axle connector to the axle. In the attaching step, no clearance exists between the axle connector and the axle when the axle connector is attached to the axle.

Frey does not teach the use of an axle connector. Instead, Frey teaches directly away from the use of an axle connector. Smith does teach that the wrapper band 232 is press-fit onto the axle 12. Further, Smith teaches thermally shrinking the wrapper band 232 onto the axle 12. However, Smith does not teach such an axle connector being used in a method wherein the axle connector is elastically deformed and extends less than completely about the axle when the axle connector is attached to the axle. No combination of the Frey and Smith references can meet the steps

and limitations recited in Claim 15. Therefore, the examiner has failed to make out a *prima facie* case of obviousness of Claim 15.

In addition, as discussed above in relation to Claim 8, the Frey and Smith references cannot properly be combined in an obviousness rejection of Claim 15. Both Frey and Smith teach away from the invention as claimed, and at least Frey teaches directly away from its combination with the other reference.

CONCLUSION

A *prima facie* case of obviousness of Claims 1-15 has not been made out by the examiner, since no combination of the cited references teaches the steps and limitations recited in each of the claims. Even if a *prima facie* case of obviousness has been made out by the examiner, the appellant has successfully rebutted such a case by demonstrating that the combination of the references asserted by the examiner are improper.

In particular, the lead reference relied on by the examiner, Frey, teaches directly away from the invention recited in each of the claims. The secondary reference, Smith, also teaches away from the method recited in the claims. Furthermore, the Frey reference teaches away from its combination with the teachings of the Smith reference.

For the foregoing reasons, it is submitted that the examiner's rejections of Claims 1-15 are in error, and reversal of his decisions is respectfully requested.

Respectfully submitted,

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APPENDIX A

[The claims as finally rejected]

1. A method of manufacturing a vehicle suspension system, the method comprising the steps of:

welding an axle connector to an axle, without first pressing the axle connector onto the axle from an end of the axle, and without using a clamp to hold the axle connector in contact with the axle; and

welding the axle connector to a pivot arm.

2. The method according to Claim 1, wherein in the step of welding the axle connector to the axle, the axle connector is held in contact with the axle by elastically deforming the axle connector.

3. The method according to Claim 2, wherein the elastically deforming step further comprises enlarging an inner dimension of the axle connector, so that the axle connector inner dimension is larger than an outer dimension of the axle at a location in which the axle connector is held in contact with the axle during the step of welding the axle connector to the axle.

4. The method according to Claim 1, wherein in the step of welding the axle connector to the axle, no clearance exists between the axle connector and the axle.

5. The method according to Claim 1, wherein in the step of welding the axle connector to the axle, the axle connector is a single structure which extends greater than halfway about the axle.

6. The method according to Claim 1, wherein in the step of welding the axle connector to the axle, the axle has a cylindrical outer surface, the axle connector is a single structure, and the axle connector extends greater than 180° about the axle outer surface.

7. The method according to Claim 1, wherein the step of welding the axle connector to the pivot arm is performed after the step of welding the axle connector to the axle.

8. A method of manufacturing a vehicle suspension system, the method comprising the step of:

attaching an axle connector to an axle by elastically deforming the axle connector, the axle connector extending less than completely about the axle when the axle connector is attached to the axle.

9. The method according to Claim 8, further comprising the steps of welding the axle connector to the axle, and welding the axle connector to a pivot arm.

10. The method according to Claim 9, wherein the axle connector is welded to the axle prior to the step of welding the axle connector to the pivot arm.

11. The method according to Claim 8, wherein in the attaching step, the axle connector extends greater than halfway about the axle.

12. The method according to Claim 8, wherein in the attaching step, the axle has a cylindrical outer surface, and the axle connector extends greater than 180° about the axle outer surface.

13. The method according to Claim 8, wherein in the attaching step, no separate clamp is used to hold the axle connector in contact with the axle.

14. The method according to Claim 8, wherein the attaching step is performed without pressing the axle connector axially onto an end of the axle.

15. The method according to Claim 8, wherein in the attaching step, no clearance exists between the axle connector and the axle when the axle connector is attached to the axle.